Andeavor (formerly Tesoro Logistics) – Ironhorse Complex Gas Plant
Full Compliance Evaluation (FCE)
On-Site Inspection

Inspection Date:	August 16, 2017
Inspection Report Date:	November 6, 2017
EPA Representatives:	Alexis North, Sara Loiacono, Joseph Wilwerding
Tribal Representatives:	
Company Representatives:	
Inspection Report Prepared By:	Joseph Wilwerding
Inspection Report Reviewed By:	Scott Patefield – Director, Air & Toxics Technical Enforcement
Last Inspection:	7/28/2015
Operating Status:	Operating
Applicable Requirements:	Title V (Pending), 40 CFR Part 60 Standards of Performance for New Stationary Sources, Subpart JJJJ (NSPS JJJJ), Subpart KKKK (NSPS KKKK), Subpart OOOOa (NSPS OOOOa) and Subpart KKK (NSPS KKK)

Facility Information and Emission Unit Identification

Parent Company Name:	Andeavor (formerly Tesoro Logistics- Rockies, formerly QEP Field Services)
Plant Operator & Name:	Ironhorse Complex Gas Plant
Plant Location:	Latitude 40.03617, Longitude -109.454827
County, State:	Uintah, Utah
Reservation:	Uintah and Ouray Indian Reservation
Tribe:	Ute Indian Tribe
Responsible Official:	VP Engineering and Operations
SIC/NAICS Code:	1321- Natural Gas Liquids, 2111112 Natural Gas Liquid Extraction
ICIS ID:	080000004904701007
Permit Status:	Pending Issuance of Title V

Inspection Findings

NSPS KKK: 2/28/2017- semiannual report for August 1, 2016 through January 31, 2017 disclosed Tesoro having missed inclusion of 12 valves and pumps in the Stagecoach/Ironhorse 1 process units subject to requirements under 40 CFR 60.482-2 and 40 CFR 40.482-7.

NSPS OOOO/OOOOa: 2/28/2017- semiannual report for August 1, 2016 through January 31, 2017 disclosed Tesoro having missed inclusion of 30 valves and connectors in the Ironhorse 2 process unit subject to requirements under 40 CFR 60.482-7a and 60.482-11a.

General Inspection Observations and Commentary

On DATE, EPA representatives Alex North and NAME met with Tesoro contacts at the WHERE at TIME am. How did it go down? Alex North utilized an Infrared (IR) Camera while taking digital photographs during the inspections.

Walk Through Inspection Observations

We arrived at the facility at TIME pm on DATE. We received a short safety summary and signed a hot work permit to use the IR camera onsite. There were YES/NO visible emissions and noted a YES/NO odor from the tanks.

Using the IR camera in high sensitivity and manual modes, Alex North followed the closed vent system from tanks to the combustor and saw no emissions.

Table 1: Operating Specifics for the Ironhorse Gas Plant VERIFY WITH OPS

Plant Capacity (MMscf/day)	
Inlet Pressure (psi)	
Outlet Pressure (psi)	
Inlet Gas From	
Outlet Gas To	
Dehydration Requirement	
CO2 Requirement	
Last Gas Analysis	

Closing Meeting

NAME and Alex North sat down with NAMES at the Tesoro office on DATE, and summarized what the EPA observed including IR video.

Anything to be done?

Regulated Source Emission Points

The table below details equipment observed onsite during the inspection and the applicable requirements.

Table 2 - Emission Units and Emission Generating Activities VERIFY WITH OPS

Equipment	Applicable Requirements	Limitations	Monitoring	
			Method	Interval
SC-PK-1100A (1) 1775 hp Caterpillar 3606LE @ Stagecoach	None (Gap)	None	None	None
SC-PK-1100B (1) 1775 hp Caterpillar 3606LE @ Stagecoach	NSPS JJJJ	NOx = 2.0 g/hp-hr CO = 4.0 g/hp-hr VOC = 1.0 g/hp-hr	Performance test	8,760 hrs of op or 3 yrs, whichever is first

SC-PK-2100 (1) 325 hp Caterpillar G3406TA @ Stagecoach	None (Gap)	None	None	None
IH1-TURBINE 1 IH1-TURBINE 2 (2) 10,240 hp Solar Taurus 70 @Ironhorse	NSPS KKKK	NOx = 25 ppm @ 15 percent O2 Fuel content = 0.06 lb SO2/MMBtu	Performance test, fuel test	Annually for both
IH2-TURBINE 1 IH2-TURBINE 2 (2) 6576 hp Solar Taurus 70 @Ironhorse 2	NSPS KKKK	NOx = 25 ppm @ 15 percent O2 Fuel content = 0.06 lb SO2/MMBtu	Performance test, fuel test	Annually for both
G-1 (1) 1141 hp Caterpillar C27 937 kVA	NSPS IIII	NOx=10.05 g/kW-hr	None	None
G-2 (1) 1502 Caterpillar C32 1250 kVA	NSPS IIII	NOx=10.05 g/kW-hr	None	None
G-3 (1) 2937 hp Caterpillar 3516C 2500 kVA	NSPS IIII	NOx=10.05 g/kW-hr	None	None
SC-R-1 (1) Hot oil heater 13.0 MMBtu/hr @Stagecoach	Alex, need this? Per 1/28/2014 T5 App after IH2 construction pg 101: NSPS for Small Industrial-Commercial-Institutional Steam Generating Units [40 CFR Part 60 Subpart Dc] Compliance Methods for the Above (Description and Citation): Comply with reporting and recordkeeping requirements of Part 60, Subpart Dc: Maintain monthly records of fuel combustion per §60.48c(g)(2) Submit an initial notification per §60.48c(a)(1)			
IH1-H (1) Hot oil heater 20.65 MMBtu/hr @Ironhorse				
IH2-H (1) Hot oil heater 44.35 MMBtu/hr @Ironhorse2				

	Retain records for two years per §60.48c(i)			
T-1 condensate (84K gal) T-2 slop (21K gal) T-3-T-6 water (12.6k gal) (6) Storage tanks	NSPS OOOO? 1/28/2014 says NO			

OBESRVATION: The following engine parameters were noted for engines:

Unit I.D.	RPM	Load (%)	Suction/Discharge (psi)	Notes
SC-PK-1100A				
SC-PK-1100B				
SC-PK-2100				
IH1-TURBINE 1				
IH1-TURBINE 2				
IH2-TURBINE 1				
IH2-TURBINE 2				

Potential to Emit (PTE[SEQ CHAPTER \h \r 1])

Based on the 12/9/2015 Title V permit application, the Ironhorse Complex gas plant is a Title V major source (greater than 100 tons per year) for criteria pollutants. See the total PTE summary below in tons per year (tpy) and Appendix A for more detail.

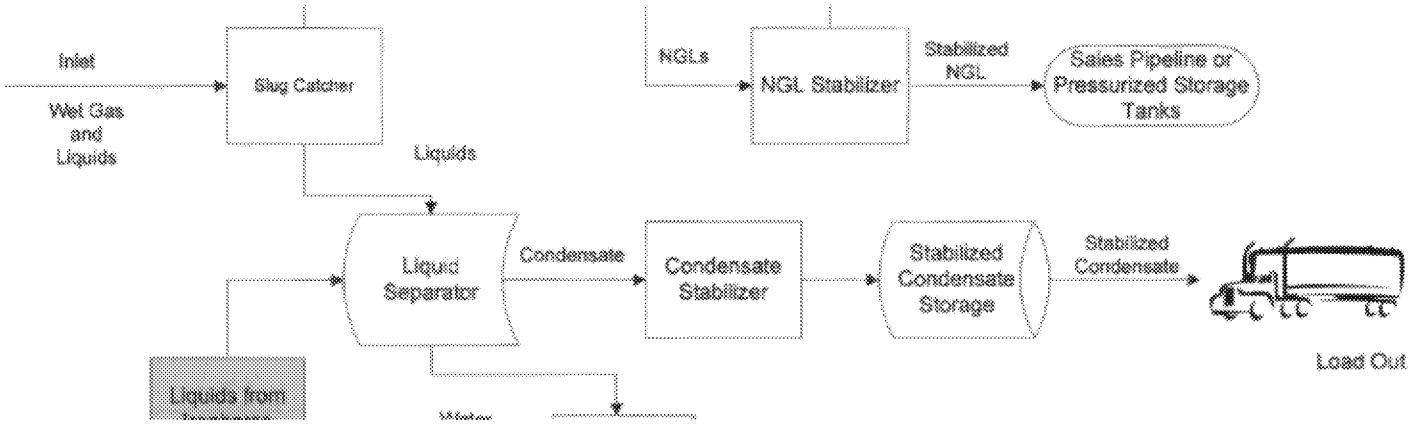
Nitrogen Oxide (NOx) = 221.3 tpy
Carbon Monoxide (CO) = 182.2 tpy
Volatile Organic Compounds (VOCs) = 150.7 tpy
Total hazardous air pollutants (HAPs) = 15.4 tpy
Greatest single HAP (Hexane) = 5.0 tpy

NOTE: QEP is using the AP-42 formaldehyde emission factor (0.19 g/hp-hr) instead of the manufacture specs (0.42 g/hp-hr), it doesn't change anything, but as you add engines, please use mfg EF when you can. Largest HAP becomes formaldehyde (6 tpy?) and combined HAP = 20 tpy?

QUESTION: Where does fed enfo for the tank controls come from? Not NSPS OOOO? What is uncontrolled PTE? Looks like emissions were modelled assuming either 365 days/year or 365 days/yr of Condensate Stabilizer operation which reduces the volatility of the slop oil. No limits/requirements on operability of the

stabilizer. 2 days stabilizer maintenance assumed per year in T-2 emission calculation; why not T-1 (zero assumed)? Only 5 days total w/o Cond Stabilizer operation would add another 5 tpy HAP to T-2 calculation. Get

- Cond Stabilizer downtime/bypass info for last 5 years.
- T-1 emission calcs/day of downtime
- T-1/T-2 throughput for last 5 years



QUESTION: Where does fed enfo for the EG reboiler and flash separator controls come from? Not MACT HH? What is uncontrolled PTE? Joe: site doesn't appear to be taking credit for flare controls (compare 1/28/14 application pg 135 to pg 18).

NSPS KKK (Title V Permit Section TBD)

The Stagecoach and Ironhorse 1 gas plants located within the Ironhorse Complex gas plant are natural gas processing plants which commenced construction between January 20, 1984 and August 23, 2011. As such both the Stagecoach and Ironhorse 1 plants are subject to this subpart. The Ironhorse 2 plant commenced construction after August 23, 2011, and is not subject to this subpart.

NSPS IIII (Title V Permit Section TBD)

Applicability

Per 60.4200(a)(2)(i), emergency generators G-1, G-2 and G-3 are CI stationary compression ignition (CI) internal combustion engines (ICE) manufactured after April 1, 2006, and are not fire pump engines, are subject to this subpart.

Emission Limitations

Per 60.4205(a), emergency generator G-1 is a pre-2007 stationary CI ICE with a displacement of 27.03 liter (L) and must comply with emission standard in 40 CFR 94.8(a)(1).

Per 60.4205(d)(1) and (3), emergency generators G-2 and G-3 are CI ICE installed prior to January 1, 2012, with displacement of greater than 30 L and must comply with the requirements of that section.

Performance Testing and Reporting

Emergency generators G-1, G-2 and G-3 are all Tier II certified engines and thus do not have any testing or reporting requirements.

NSPS JJJJ (Title V Permit Section TBD)

Applicability

Per §60.4230(a)(5), engine PK-1100B is a spark ignition (SI), lean burn, 1775 hp internal combustion engines (ICE) constructed after June 12, 2006 and manufactured after July 1, 2007.

Emission Limitations
Per 60.4233(f)(4) and NSPS JJJJ Table 1, engine PK-1100B installed oxidation catalyst in order to meet the following emission standards for a non-emergency SI natural gas greater than 500 hp, manufactured > 7/1/2007 (NOx = 2.0 g/hp-hr or 160 ppmvd @ 15% O_2, CO = 4.0 g/hp-hr or 540 ppmvd @ 15% O_2, VOC = 1.0 g/hp-hr or 86 ppmvd @ 15% O_2).

Performance Testing
Per §60.4243(c) then (b)(2)(ii) engine PK-1100B must conduct performance tests every 8,760 hours of operation or 3 years, whichever comes first.

OBSERVATION: Tesoro performed and submitted performance test reports demonstrating compliance with NSPS JJJJ emissions limitations (see below).

Table X: NOx, CO and VOC Results for Engine PK-1100B (Serial 4ZS00879)

	ppmvd @ 15% O_2					
Test Date	Avg NOx	JJJJ NOx Limit	Avg CO	JJJJ CO Limit	Avg VOC	JJJJ VOC Limit
4/27/2016	26.08	160	10.01	540	31.35	86
5/1/2013	20.55	160	6.27	540	8.22	86
5/4/2012	29.84	160	15.17	540	20.22	86

NSPS KKK (Title V Permit Section TBD)

Applicability
NSPS KKK applies to compressors and "the group of all equipment except compressors (defined in § 60.631) within a process unit" (*see* 40 C.F.R. § 60.630(a)(3)), "that commences construction, reconstruction, or modification after January 20, 1984, and on or before August 23, 2011" (*see* 40 C.F.R. § 60.630(b)). Equipment is defined in 40 C.F.R. § 60.631 as "each pump, pressure relief device, open-ended valve or line, valve, compressor, and flange or other connector that is in VOC service or in wet gas service, and any device or system required by this subpart."

NSPS KKK sets standards for VOC leaks from natural gas processing plants by making equipment subject to certain provisions under NSPS Subpart VV. The standards require monitoring of specified equipment, including but not limited to valves and pumps, for VOC leaks on a specific schedule; keeping records of the monitoring; use of Method 21 to monitor; repairing or attempting to repair certain leaks by set deadlines; reporting of monitoring results; and maintaining specified work practices, such as sealing open-ended lines. Method 21 sets forth the procedure for use of an instrument to detect VOC leaks, including but not limited to calibration requirements and how long and where to use the probe at each component monitored.

Reporting 60.487, 60.636
2/28/2017- semiannual report for August 1, 2016 through January 31, 2017 disclosed Tesoro having missed inclusion of 12 valves and pumps in the Stagecoach/Ironhorse 1 process units subject to requirements under 40 CFR 60.482-2 and 40 CFR 40.482-7. The report disclosed the following changes in component counts:

August Component Counts	January Component Counts
Valves: 3255	Valves: 3305
Connectors: NA	Connectors: NA
Compressors: 13	Compressors: 13
Pumps: 17	Pumps: 20
Other: 2111	Other: 2148
Relief Valves: 76	Relief Valves: 76

QUESTION: Determine if capital expenditure calculations for possible OOOOa trigger were performed (3 out of 17 [14%] pumps added). Tesoro has not split up the Stagecoach and Ironhorse areas into 'process units' as defined under KKK/OOOO. First allocate correctly, then perform calculations.

8/29/2016, LDAR semi-annual for Stagecoach and Ironhorse 1 process trains: Tesoro reported an increase of 179 components to the Ironhorse 1 unit.

QUESTION: see if OOOOa was triggered.

8/11/2015, LDAR semi-annual for Stagecoach and Ironhorse 1 process trains
2/25/2015, LDAR semi-annual for Stagecoach and Ironhorse 1 process trains

Fugitive Emission calculations done incorrectly: assume 92-99% control efficiencies for valve/pump KKK monitoring programs (based on use of only <10k ppm leak factor; should have used both <10k (for nonleaks) + >10k (for leaks)). Should only be 45-65% control effectiveness (95 protocol table 5-3). Also, large increase in component counts since 1/28/14 permit application (1326 to 1869 at Stagecoach). 13 tpy total VOC calculated for Stagecoach. Currently only 2.5 tpy HAP calculated from fugitives. Get updated HAP calculations.

NSPS KKKK (Title V Permit Section TBD)

Applicability

Per 60.4305(a), turbines at Ironhorse 1 (IH1-1 and IH1-2) and Ironhorse 2 (IH2-1 and IH2-2) are stationary combustion turbines with heat inputs greater than 10 MMTbtu per hour and commenced construction after February 18, 2005, and are subject to this subpart.

Emission Limitations

Per 60.4320 and Table 1 (New turbine firing natural gas), the turbines at Ironhorse 1 (IH1-1 and IH1-2) and Ironhorse 2 (IH2-1 and IH2-2) fire natural gas, have heat input rates of 47.8 MMBtu/hr and commenced construction after February 18, 2005 (new), and are subject to a 25 ppm @ 15 percent O2 emission limitation.

Per 60.4330(a)(2), the turbines at Ironhorse 1 (IH1-1 and IH1-2) and Ironhorse 2 (IH2-1 and IH2-2) must not burn any fuel which contains total potential sulfur emissions in excess of 0.060 lb SO2/MMBtu.

Performance Testing

Per 60.4340(a) the turbines at Ironhorse 1 (IH1-1 and IH1-2) and Ironhorse 2 (IH2-1 and IH2-2) are not using water or steam injection to control NOx and thus must perform a performance test annually or every 2 years if the results of the performance test results are less than or equal to 75 percent of the NOx emission limit for the turbine (.75 x 25 = 18.75), performance tests may be performed every 2 years.

OBSERVATION: See NOx performance tests below.

Table X: NOx Results for Turbine C-101 (Serial OHK15B2237)

	ppm @ 15% O_2	
Test Date	Avg NOx	KKKK NOx Limit
4/5/2016	2.82	25
6/11/2015	10.71	25
7/30/2013	7.55	25
7/10/2012	14.08	25

Table X: NOx Results for Turbine C-102 (Serial

	ppm @ 15% O_2	
Test Date	Avg NOx	KKKK NOx Limit
4/5/2016	2.82	25
6/11/2015	3.77	25
7/30/2013	5.93	25

Table X: NOx Results for Turbine C-202 (Serial 0744B)

	ppm @ 15% O_2	
Test Date	Avg NOx	KKKK NOx Limit
8/27/2015	6.43	25
8/30/2013	1.04	25

Table X: NOx Results for Turbine C-201 (Serial 0743B)

	ppm @ 15% O_2	
Test Date	Avg NOx	KKKK NOx Limit
8/27/2015	4.96	25
8/30/2013	0.65	25

Per 60.4370(c)(1)(iii)(C), annual sulfur content measurements are acceptable as long as the sulfur content is less than half the standard (0.06 x .5 = 0.03). Per the September 22, 2016 semiannual monitoring report, the total sulfur content from a sample collected on 8/16/2016 was 1.5 ppmv for Ironhorse 2, and 1 ppmv for Ironhorse 1.

OBSERVATION: See the fuel sulfur content test results below.

9/22/2016- IH2-1 and IH2-2, 0.000242 lb SO2/MMBtu
9/22/2016- IH1-1 and IH1-2, 0.000161 lb SO2/MMBtu
9/4/2015- IH1-1 and IH1-2, 0.001079 lb SO2/MMBtu
9/4//2015- IH2-1 and IH2-2, 0.000407 lb SO2/MMBtu

NSPS OOOO/OOOOa (Title V Permit Section TBD)

Applicability 60.5365

All equipment at the Stagecoach and Ironhorse 1 gas plants predate the August 23, 2011 applicability date. Pneumatic controllers at the Ironhorse 2 plant are not subject because they are driven solely by instrument air. There are no reciprocating compressor or atmospheric storage tanks associate with the Ironhorse 2 plant. There is one centrifugal, wet seal compressor, but it is considered a screw or rotary compressor and not subject to this subpart. Per 60.5365(f), the equipment, excluding compressors, at the Ironhorse 2 plant is considered an affected facility and subject to the leak detection standard sand must comply with 40 CFR Part 60, Subpart VVa.

NSPS OOOO and NSPS OOOOa set standards for VOC leaks from natural gas processing plants by making equipment leak sources subject to certain NSPS Subpart VVa provisions. The standards require monitoring of specified equipment, including but not limited to valves, pumps, and connectors, for VOC leaks on a specific schedule; keeping records of the monitoring; use of Method 21 to monitor; repairing or attempting to repair certain leaks by set deadlines; reporting of monitoring results; and maintaining specified work practices, such as sealing open-ended lines. Method 21 sets forth the procedure for use of an instrument to detect VOC leaks, including but not limited to calibration requirements and how long and where to use the probe at each component monitored.

Reporting 60.5420, 60.5420a

2/28/2017, LDAR semi-annual Ironhorse 2 process train
2/25/2015, LDAR semi-annual report Ironhorse 2 process train

NSPS OOOOa (Title V Permit Section TBD)

8/4/2016- notice of applicability of LDAR requirements at Ironhorse 2; no indication of what event precipitated the applicability, besides that OOOOa had been finalized.

Question: what event triggered OOOOa?

2/25/2016- LDAR semi-annual report at Ironhorse 2
2/28/2017- semiannual report for August 1, 2016 through January 31, 2017 disclosed Tesoro having missed inclusion of 30 valves and connectors in the Ironhorse 2 process unit subject to requirements under 40 CFR 60.482-7a and 60.482-11a.

MACT HH

There are no MACT HH requirements for ethylene glycol dehydration units at area sources for HAPs.

See questions on tank, engine, and fugitive HAP calculations. Looks like PTE could be slightly over 25 tpy.

MACT ZZZZ (Title V Permit Section TBD)

Engines SC-PK-1100A and SC-PK-2100 are considered new affected sources, commenced construction after June 12, 2016, and are located at an area source of HAPs. They comply with MACT ZZZZ by complying with NSPS JJJJ. However, the engines were manufactured before the NSPS JJJJ applicability date of 7/1/2007 and are considered to be "gap" engines with no requirements.

OBSERVATION: Verify commenced construction and manufacture dates and HP for these engines.

Annual Fees and Emissions Inventory

OBSERVATION: The following annual emissions reports and annual fees for the past five years have been received for the Ironhorse Complex.

Received Date	Reporting Year	NOx	VOC	SO_2	PM_{10}	HAP Total	Fee Paid
March 29, 2013	2012	60.07	82.73	0.16	4.7	1.65	$7,152.84
March 26, 2014	2013	91.1	86.9	0.2	7.9	5.0	$9,146.82
March 26, 2015	2014	84.5	80.2	0.3	7.7	4.9	$8,637.89
March 30, 2016	2015	116.3	83.6	0.3	8.1	5.0	$10,433.28
March 29, 2017	2016	68.4	70.4		0	0	$7,012.67

TABLE 3-2. Facility Equipment Inventory

Emission Source ID	Emission Source Description	NO_x (tpy)	CO (tpy)	VOC (tpy)	PM/PM_{10} (tpy)	SO_2 (tpy)	Hexane* (tpy)	Total HAPs (tpy)	CO_2e (tpy)
SC-PK-1100A	Caterpillar 3606LE	10.11	36.11	9.39	0.00	0.03	5.61E-03	3.57	5912.5
SC-PK-1100B	Caterpillar 3606LE	28.89	57.78	14.45	0.00	0.03	5.61E-03	1.30	5912.5
SC-PK-2100	Caterpillar G3406TA	80.53	6.81	0.63	0.11	0.01	0.0	0.37	1331.3
IH1-TURBINE-1	Solar Taurus 70	12.57	12.77	7.33	1.53	0.02	0.0	0.23	27177.7
IH1-TURBINE-2	Solar Taurus 70	12.57	12.77	7.33	1.53	0.02	0.0	0.23	27177.7
IH2-TURBINE-1	Solar Taurus 70	12.57	12.77	7.33	1.53	0.02	0.0	0.23	27181.5
IH2-TURBINE-2	Solar Taurus 70	12.57	12.77	7.33	1.53	0.02	0.0	0.23	27181.5
G-1	Caterpillar C27	3.35	0.15	0.02	0.01	0.00	0.0	0.00	299.8
G-2	Caterpillar C32	4.08	0.11	0.01	0.01	0.00	0.0	0.00	416.6
G-3	Caterpillar 3516C	8.73	0.47	0.18	0.05	0.01	0.0	0.01	778.4
SC-R-1	13.1 MMBtu/hr Hot oil heater	5.63	4.73	0.31	0.43	0.03	1.01E-01	0.11	6712.0
IH1-H	24.15 MMBtu/hr Hot oil heater	10.37	8.71	0.57	0.79	0.06	1.83E-01	0.19	12373.7
IH2-H	44.35 MMBtu/hr Hot oil heater	19.04	16.00	1.05	1.45	0.11	3.37E-01	0.35	22723.6
T-1	84,000 gal Condensate Tank	0.0	0.0	4.41	0.0	0.0	2.95E-1	0.37	0.00
T-2	21,000 gal Slop Tank	0.0	0.0	29.18	0.0	0.0	1.58	1.80	126.2
T-3-T-6	4-Interconnected Storage Tanks	0.0	0.0	1.49	0.0	0.0	0.0	0.00	3.7
SC-S-1	EG reboiler and flash separator vents	0.0	0.0	6.98	0.0	0.0	9.52-E-02	2.28	469.0
SC-C-1	0.22 MMbtu/hr - High pressure flare	0.10	0.08	0.00	0.01	0.00	1.62E-03	0.00	113.9
SC-C-2	0.18 MMbtu/hr - Low pressure flare	0.17	0.09	0.00	0.01	0.00	1.35E-03	0.00	188
IH-C	0.18 MMbtu/hr - Ironhorse flare	0.07	0.06	0.00	0.01	0.00	1.35E-03	0.00	91.1
SC-VE	Engine startups, compressor blowdowns	0.0	0.0	2.24	0.0	0.0	0.0	0.01	29.1
IH1-VE	Engine startups, compressor blowdowns	0.0	0.0	22.10	0.0	0.0	0.50	0.72	4282.8
IH2-VE	Engine startups, compressor blowdowns	0.0	0.0	28.35	0.0	0.0	0.59	0.77	4228.9
LO	Truck loadouts	0.0	0.0	0.94	0.0	0.0	0.0	0.00	0.0
SC-EL	Equipment leaks	0.0	0.0	8.19	0.0	0.0	0.63	1.31	117.1
IH1-EL	Equipment leaks	0.0	0.0	5.21	0.0	0.0	0.37	0.75	204.9
IH2-EL	Equipment leaks	0.0	0.0	4.32	0.0	0.0	0.31	0.63	116.0
Total		**221.3**	**182.2**	**150.7**	**9.0**	**0.4**	**5.0**	**15.4**	**174,619**

*Hexane emissions represent the highest individual HAP.

APPENDIX B: PHOTO LOG

Frame	Date	Photographer	Description

APPENDIX C: Google map view of facility